SCHRODINGER EQUATION FOR LIGHT (LUX)

Miroslaw Kozlowski

Senior Researcher Warsaw University, Warsaw, Poland

Abstract

In this paper, the author developes the Schrodinger Equation (hyperbolic) for Lux.

Introductory

In Mother of all languages , *Latin*. exists two words describing Light.
One, *Lumen* is for "source" which emits Light. Second *Lux* is the "body" of the Light, which is propagating through void
In my essay I discussed the Schrodinger equation for *Lux*
In our monograph From Infinity to Infinity and Beyond we formulated the hyperbolic partial differential equation for the field with space dependence R^{-2}. It means we consider 3D space only:
The universal constants *G*, *c* and *ħ* comprise the Planck mass, $(\hbar c/G)^{1/2}$ ≈10-5g. We present arguments for the existence and properties of particles with this mass, describe how they serve as the constituents for a gravitational theory of matter, and for quantum mechanics

In physical cosmology, the Planck epoch is the earliest period of time in the history of the universe, from zero to approximately 10−43 seconds. It is believed that, due to the extraordinary small scale of the universe at the time, quantum effects of gravity dominated physical interactions. During this period approximately 13.8 billion years ago gravitation is believed to have been as strong as the other fundamental forces, and all the forces may have been unified. Inconceivably hot and dense, the state of the universe during the Planck epoch was unstable, tending to evolve, giving rise to the familiar manifestations of the fundamental forces through a process known as symmetry breaking. This has also been theorized to be the earliest moment of time that can be meaningfully described. Modern cosmology now suggests that the Planck epoch may have inaugurated a period of unification, known as the grand unification epoch, and that symmetry breaking then quickly led to the era of cosmic inflation, the Inflationary epoch, during which the universe greatly expanded in scale over a very short period of time.

In this two column , on the left the usual Planck Epoch (numbers) are presented. On the right column we take into account that Planck mass is equal to Human neuron mass, Ω

$$Mp = \sqrt{\frac{\hbar c}{G}} \qquad \Omega = \sqrt{\frac{\hbar c}{G}}$$

$$Lp = \sqrt{\frac{\hbar G}{c^3}} \qquad Lp = \sqrt{\frac{\hbar G}{c^3}}$$

$$Tp = \sqrt{\frac{\hbar G}{c^5}} \qquad Tp = \sqrt{\frac{\hbar G}{c^5}}$$

2. The model equation

To discuss the similarity let us start with the local Schrödinger equation with finite Planck mass [1]:

$$i\hbar \frac{\partial \Psi}{\partial t} = V\Psi - \frac{\hbar^2}{2m}\nabla^2\Psi - \tau\hbar \frac{\partial^2 \Psi}{\partial t^2} \tag{1}$$

The new relaxation term (memory term) in comparison to standard Schrodinger equation

$$\tau\hbar \frac{\partial^2 \Psi}{\partial t^2} \tag{2}$$

describes the interaction of the particle with mass *m* with space-time.

The relaxation time τ can be calculated as

$$\tau^{-1} = \left(\tau_{e-p}^{-1} + \ldots + \tau_{Planck}^{-1}\right) \tag{3}$$

where $\tau_{e-p} \sim 10^{-17}$ s denotes the scattering of the particle *m* on the electron – positron virtual pair, $\tau_{Planck} \approx 10^{-43}$ s

$$\tau_{Planck} = \frac{\hbar}{\Omega c^2} \tag{4}$$

where Ω is Planck mass.

Considering Eqs (1-4) Eq. (1) can be written as:

$$i\hbar\frac{\partial\Psi}{\partial t}=-\frac{\hbar^2}{2m}\nabla^2\Psi+V\Psi-\frac{\hbar^2}{2\Omega}\nabla^2\Psi+\frac{\hbar^2}{2\Omega}\left(\nabla^2\Psi-\frac{1}{c^2}\frac{\partial^2\Psi}{\partial t^2}\right) \tag{5}$$

As can be seen from Eq (5) for $\Omega\to\infty$ one obtains non-local Schrödinger equation , c=

$$i\hbar\frac{\partial}{\partial t}\Psi=-\frac{\hbar^2}{2m}\nabla^2\Psi+V\Psi \tag{6}$$

From equation (5) can be concluded that Schrödinger QM is valid for particles with $m<<M_p$. The last term

$$\frac{\hbar^2}{2M_p}\left(\nabla^2\Psi-\frac{1}{c^2}\frac{\partial^2\Psi}{\partial t^2}\right) \tag{7}$$

when is equal zero

$$\nabla^2\Psi-\frac{1}{c^2}\frac{\partial^2\Psi}{\partial t^2}=0 \tag{8}$$

Equation (6) is the SCHRODINGER EAUATION (The wave equation) for object moving with velocity c. Lux velocity in the void

Reference

Janina Marciak-Kozłowska, Mirosław Kozłowski, From Infinity to Infinity and Beyond, , NOVA, Publishers, USA, 2014